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ABSTRACT

This report evaluates an "effective schools" intervention project, the purpose of which was to improve achievement on proficiency tests in selected Knoxville City Schools (KCS). Six target schools, predominantly serving Knoxville's impoverished areas as identified by Chapter I and census data, were selected to work toward improving proficiency test scores of grade nine pupils. Effective school literature provided the framework for the intervention; school personnel implemented the correlates of effective schools. Students, staff/teachers, and parent/guardians received various "treatments" in keeping with effective schooling elements. The Bureau of Educational Research and Services was called upon to: (1) develop an interim evaluation report covering the first year of operation of this pilot project; and (2) develop and design an evaluation format to be used throughout the rest of the project to guide evaluation efforts. Data were collected, including scores on the State Proficiency Test, anecdotal reports, logs and timetables of activities, and teacher questionnaire data. Based on several analyses of varying degrees of sophistication, the Knoxville City School Proficiency Project was successful in achieving its major purpose of improving the test scores of ninth-graders. As with many effective schools projects, this evaluation was not able to identify which treatments had greatest impact. (LMO)

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EVALUATION OF AN "EFFECTIVE SCHOOLS" INTERVENTION

The Knoxville City Schools (KCS) Proficiency Test Project in Selected Ninth Grades

1984-1985

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EVALUATION OF AN "EFFECTIVE SCHOOLS" INTERVENTION

The Knoxville City Schools (KCS) Proficiency Test Project in Selected Ninth Grades

1984-1985*

INTRODUCTION

Background

The "first generation" of effective schools studies described what occurred in schools that were instructionally effective. These descriptions provided a "wellness" view of schools as educators began to look at what was good in schools. Standards to measure effective schools have been called by some as too narrow (focus only on tests scores), but at least the results are measurable and the results are giving educators some positive things to report. Results in effective schools mesh with what we "feel" should be right in education; they provide us a positive, education model (not a business model or a medical model) to follow. Generally, theorists contend that efforts in instructionally effective schools reduce or remove systematic differences in the achievement of higher or lower SES youngsters and achievement differences related to such variables as pupil race and/or sex.

Early effective schools studies, including the work Edmonds (1979), Brookover (1979), Weber (1971), and others continuously found several factors associated with effective schools. Those factors, often called correlates of effective schools, were: strong building level leadership, an emphasis on basic skills, a climate conducive to learning, high expectations, continuous monitoring of pupil progress and use of those results in the instructional program. There frequently were other attendant variables: community and

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central office support, and improved staff development activities.

Often striking results were obtained with elementary-school, inner-city, low-SES youngsters (e.g., Achilles, et. al., Achilles and Young, others) by implementation of effective schools approaches. In some of these studies, pupils who started considerably below the "norm" (city, area, state, or national) progressed until they were considerably above the norm on the standardized tests. The effective schools interventions, if applied with youngsters showing the above-mentioned characteristics, seemed to bring about pupil achievement that was greater than expected (given the usual results with youngsters displaying these characteristics).

Although the "effective schools" movement is spreading rapidly, there have been no lack of critics of effective schools research for such things as poor design, lack of control, poorly defined treatments (e.g., Rowan et. al., 1983; Rowan, 1984), and of the movement itself (e.g., Cuban, 1983; Sirotnik, 1985). Some believe that the focus of effective schools is too narrow (measuring success only by gains on standardized tests). Nevertheless, the five "correlates" (Edmonds, 1979) and other factors more recently found to be associated with effective schools are not just being sought "in the field," they are being implemented in various ways in planned programs to achieve change and raise pupil achievement test scores. Rather than the earlier "field research" efforts, there now are planned interventions that are the subject of evaluation research. In this sense we may talk about two "generations" of effective schools studies.

Many early studies described what existed; few explained how the correlates came about. At first researchers sought schools where youngsters did better than expected on tests and then described what was going on in those schools.

It was left for a second generation of studies to research and describe just how these correlates of effective schools could be effected. Thus, researchers are not only seeking elements that improve school effectiveness, they are now studying the planned implementation of factors related to school effectiveness and evaluating results of this implementation. (Achilles, et. al., 1983, 1985). In a typical project, schools with high percentages of students performing below norm on standardized tests are identified. Interventions consist of conscious attempts to implement in those schools the "correlates" of effective schools with the presumption that implementation of these variables will lead to increased student outcomes. Increased student outcomes become the criteria against which evaluators assess the impact of the "treatment." In this sense, effective schooling research has moved from descriptive approaches to a quasi-experimental process where analyses are made at least on the basis of school outcomes before and then after the treatment (implementation of effective schooling elements). Comparison groups are sometimes used as a type of "control." The current study fits into this second generation category.

THE CURRENT STUDY: A SUMMARY*

Grade-nine pupils in three Knoxville (TN) inner-city high schools consistently performed below the city average (and average of the other five high schools) on the state-administered proficiency test. The three low-performing high schools accept students from three middle schools. These six schools predominantly serve Knoxville's most impoverished areas as identified by Chapter I and census data. At the urging of the Superintendent and Board, a Task Force sought a State Department of Education grant to help

*The name of the school system and the names of the participating schools are used since 1) results are generally positive, and 2) no individuals are identified.

city educators work toward improving the proficiency test scores of grade-nine pupils in the three "target" schools. The effective school literature (see, for example, selections in the Bibliography, p. 28) provided the framework for the intervention; the school personnel implemented the correlates of effective schools in the six schools.

According to the proposal, three groups were to receive various "treatments." Those groups and treatments are:

Table 1
Summary of Groups and Treatments

Teachers/Ed. Personnel	Pupils	Parents/Guardians/Home
TESA TN. Instr. Model (TIM) Class Organization Teaching Extra Materials Extra In-Service	IEP Peer Tutor Community Tutor "Precision Teaching" Additional Materials STL and Group Work Special Study Skills	More Home-School Effort Explanation of Model Home Stimulation; Effective Study Habits Aspirations/ Expectations

A director and three special teachers who conducted project activities stressed home support (parental involvement). The students received treatments (noted by X) as shown in Table 2(A). Project staff and Chapter I teachers received treatments (noted by X) as shown in Table 2(B) (TESA is planned for 1985-86). Parents/guardians and community received treatments (noted by X) as shown in Table 2(C). Examples of project activities were reviewed by external evaluators. A timeline of completed events/activities for the first year of the project was developed. Monitoring of timeline events assured a degree of confidence that the project was, indeed, implemented as planned. (Leithwood and Montgomery, 1982). Monitoring guarded against the "non-event" as described by such researchers as Charters and Jones (1973) and Hall and Loucks (1977).

Table 2

Treatments by Group by School for (A) Students, (B) Education Personnel and (C) Community/Parents

A. Students Treatments	Grade 9 A/E	Grade 9 Fulton	Schools Rule	Schools Bdsly	Grade 8 C' berry	Grade 8 Vine
1. IEP	X	X	X	X	X	X
2. Peer Tutor	X	X	X	X	X	X
3. Community Tutor	X	X	X	X	X	X
4. "Precision Teaching"	X	X	X	X	X	X
5. Additional Materials*	X	X	X	X	X	X
6. STL and Group work**	X		X	X		X
7. Special Studies Skills***	X	X	X	X	X	X

* Prepared learning packets are located in individual schools.
** Fulton and Christenberry project teachers did not take STL formal training but used STL technique with students.
*** These skills were taught in Chapter I Language Arts Classes in the middle and high schools.
Bdsly = Beardsley; C' berry = Christenberry.

B. Staff and Teachers Treatments	Grade 9 A/E	Grade 9 Fulton	Schools Rule	Schools Bdsly	Grade 8 C' berry	Grade 8 Vine
1. TESA						
2. TIM*	X	X	X	X	X	X
3. Class Organization/ Effective Teaching	X	X	X	X	X	X
4. Extra Materials**	X	X	X	X	X	X
5. Extra In-Service (STL)	X		X	X		X

* Additional TIM training will be conducted in the second project year.
** The project director helped secure texts and supplies by request.
TIM=Tennessee Instr. Model. STL=Student-Team Learning. TESA= Teacher Expectation/Student Achievement.

C. Parents/Guardians Treatments	Grade 9 A/E	Grade 9 Fulton	Schools Rule	Schools Bdsly	Grade 8 C' Berry	Grade 8 Vine
1. More Home-School Effort	X	X	X	X	X	X
2. Explanation of Model	X	X	X	X	X	X
3. Home stimulation; Study Habits	X	X	X	X	X	X
4. Aspirations/Expectations	X	X	X	X	X	

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Community Support Factor

An additional benefit was the outstanding support, tutors, and incentive awards furnished to teachers and students by several local businesses. The Coca-Cola Company adopted the Proficiency Project through the Adopt-A-School Plan and was particularly supportive. Twenty-two other groups helped.

"Effective Schools" and the KCS Project

This project included many elements of the current "effective schools" efforts. The evaluators compared project efforts against a model of effective schooling elements. (Edmonds, 1979; Brookover et. al., 1982; See Bibliography Section). Implementation efforts, although less detailed and elaborate, were similar to Project SHAL, St. Louis, and SHAL's implementation model (Achilles, et. al., 1983, 1985). This project, although not labelled as an effective schools project at the outset, included many elements of current "effective schools" efforts. The evaluators compared project efforts against a model of effective schooling elements. (Figure 1).

Generally speaking, the KCS project incorporated most, if not all, of the "effective schools" elements described in the literature. The KCS project differs from many effective schools efforts by focusing on middle schools (grade 8) and high schools (grade 9) rather than the usual elementary or elementary/middle school focus. The secondary emphasis is interesting, given the usual elementary-school focus of these projects.

As with many local system projects, activities began before development of an evaluation plan. In May, 1985, the Superintendent contacted the Bureau of Educational Research and Services (BERS), College of Education, University of Tennessee, Knoxville for assistance in achieving two general objectives:

Edmonds' "Five Correlates"	KCS Implementation Efforts
Strong Administration Leadership Basic Skills Focus Climate Conducive to Learning High Expectations Monitor Pupil Progress	• Task Force • Study Skills, Chapter I, etc. • Rewards System (e.g."Coke Incentive Awards") • Work with Teachers, Community, "Good Press" • Pre-proficiency Scores; Admission to Project
Other "Effective Schools" Characteristics	
Structure Strong Central Office Support Inner City, Low SES, High % Minority Elementary/Middle School Focus Extra Inservice Community Involvement Continuity/Stability "Success" is narrowly defined	• Task Force • Task Force, Proposal, Visibility • Yes • Partial. Grade 9 was "target" • Yes (TIM, STL) • Yes (Community and Parent) • (Time will tell) • Increase % Passing Proficiency Test

Figure 1. Effective Schools elements of KCS Proficiency Project.

(1) Develop an interim evaluation report covering the first year of operation of this pilot project; and

(2) Develop and design an evaluation format to be used throughout the rest of the project to guide evaluation efforts.

The evaluation design would be a long-term effort but an "interim report" would provide some indicators of project directions. Gross measures such as total percent passing the Language Arts (LA) and Math (M) proficiency tests in various high schools, and comparisons of these scores over time, were preliminary indicators of project progress. Additional data included anecdotal reports, logs and timelines of activities, and teacher questionnaire data. Pretest/posttest data from experimental (n=170) and control groups (n=175) were analyzed to determine the impact (if any) of the project on pupil performance.

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This design is shown in Figure 2.

Time	Condition	MEASURES Math	Lang. Arts
Pretest	Experimental	- - - - - - - -	- - - - - - - -
	Control		
Posttest	Experimental	- - - - - - - -	- - - - - - - -
	Control		

Figure 2. Basic Design for the KCS Evaluation.

The project included several components; complexity and lack of baseline measures prior to implementation mitigated against an evaluation to identify the impact of various treatments. The following outline provided a way to organize data collection, analysis, and reporting.

Data Type ↓ / Focus →	Process (Formative)	Product (Summative)	Level of Implementation
Qualitative	Teacher questionnaires, Logs, Staff Reports	Questionnaires. Examples of Activities.	Examples from Timeline of Events
Quantitative	Teacher records; Timeline, Historical data.	Experimental and Control Comparisons.	Data from Treatments; Observations.

Figure 3. Outline to Organize the KCS Evaluation Results.

Limitations

This evaluation occurred under less than optimum conditions in terms of strict research and evaluation design. The design is ex post facto and quasi-experimental, incorporating some elements of case study. Data analysis is primarily arithmetic: percents, averages, ranks. Some comparisons to city-wide averages are appropriate. It is most important to document, describe, and assess the degree of treatment implementation. The evaluators must know if the treatment is in effect so that 1) success, if any, can be related to the treatment, or 2) gains, if any, will not be attributed to the project if there were little or no implementation.

The Project purpose is "Improving Achievement on Proficiency Tests In Selected Knoxville City Schools." The final measures of success, then, for ninth grades would be a) increase in percent of pupils passing the Proficiency Test (or Basic Skills Tests) or b) increase of the scores achieved by those taking the tests (whether or not the pupil passes). Measures for this study were scores on the State Proficiency Test for grade nine on Mathematics (M) and Language Arts (LA). This criterion-referenced test has been used since 1982.

FIRST-YEAR RESULTS

Sampling Procedures: Experimental and "Control" Groups

Nearly 1000 students were involved in the Project (approximately 600 in the three 9th grades and 400 in the three 8th grades). Two samples were drawn for comparison and analysis. Using all eligible ninth grade pupils an "experimental" sample was randomly drawn (n=170). Next, from "Other" schools a stratified (by free or reduced lunch) random sample of grade nine pupils was drawn as a "control" (n=175). Only pupils with four scores (pretest M and LA; posttest M and LA) were included. The total sample (n=345) met the .95 confidence limits (n=278 required). Table 3 shows the demographics of the sample.

Table 3
Demographics Of Sample Of Experimental
And Control Grade Nine Youngsters In
Knoxville City Schools Proficiency Project (1984-85)

	SEX				RACE			
	Male		Fem.		Wh.		Non-Wh.	
Group	n	%	n	%	n	%	n	%
Experimental (x) n=170	83	49	87	51	82	48	88	52
Control (o) n=175	93	53	82	47	134	77	41	23

Reporting Limitations

This paper does not report the results of teacher pre/post questionnaire data or needs assessments. Those results, generally very positive, appear in the first year evaluation report. This paper only focuses on pupil gains.

Initial Gross Comparisons

The project's major purpose was to "improve achievement on proficiency tests in selected Knoxville City Schools." The state proficiency test is given in grade nine. Table 4 shows 1) the percent of grade-nine students by school (and city average) passing the proficiency tests in Math (M) and Language Arts (LA) for three pre-project years (1981-1984) and after one project year (1985) and 2) the average percent passing for 1982-84 combined.

Although scores in some schools remained fairly constant over the years (e.g., LA in Bearden with a low of 86.5% and high of 94.5%, or 8% change) other schools had considerable variability (e.g., Austin-East with a low LA of 33.1% and high LA of 69.3%, or 36.2% change). Table 5 shows the range (between high and low scores) on M and on LA for 1982-1985 for each school. On five of six comparisons the target school ranges exceeded the city ranges; in Fulton (M) the target-school range was less than the city's. Only one of 12 ranges reported for non-target schools (Holston, LA) exceeded five of the six target-school ranges. Figure 4 shows Table 4 data in graphic form. Note that the target schools are gaining. (The lines are converging.) Figure 5 shows gains over the "baseline" of 1982-84 percents and that these gains are more pronounced in target than in other schools or the city-as-a-whole.

TABLE 4
Annual Percent Passing Proficiency Tests by School (1982-1985)
and Average Percent by Target and Other
Schools, Knoxville, 1982-1984

	1982		1983		1984		1985		$\bar{X}$ 82-84	
Target Schools	M	LA	M	LA	M	LA	M	LA	M	LA
A. East	46.4	33.1	59.8	40.6	76.2	54.8	85.6	69.3	60.8	42.8
Fulton	91.0	60.7	88.2	71.3	87.7	73.8	91.0	82.2	88.9	68.6
Rule	74.1	52.3	72.5	53.6	64.1	53.5	87.8	64.7	70.2	53.1
Ave.	74.7	51.1	76.6	58.6	77.5	62.9	88.5	73.6	76.2	57.4
Others										
Bearden	92.6	90.4	92.3	86.5	94.1	92.2	94.5	92.3	93.0	89.7
Central	94.1	79.6	93.6	85.4	90.9	83.2	90.3	82.0	92.9	82.7
Holston	95.1	61.7	93.5	74.8	97.6	80.6	97.7	87.6	95.5	72.4
S. Young	74.8	62.2	78.5	62.7	77.9	67.0	80.8	68.7	77.1	64.0
West	82.0	70.1	83.5	80.1	82.1	78.0	90.3	80.1	82.5	76.1
Ave.	86.8	74.1	86.7	77.8	86.7	79.5	91.0	83.5	86.7	77.2
City Ave.	83.0	66.9	83.7	72.1	84.1	74.8	88.3	78.8	83.6	71.2

*City average included more pupils than the sum of these eight schools.

TABLE 5
Range in Percent Passing Tests, Grade 9
Knoxville City 1982-1985

	Range in Percent Passing Tests			
	M	Years	LA	Years
A. East*	39.2*	82-85	36.2*	82-85
Bearden	1.9	82-85	1.9	82-85
Central	3.8	82-85	2.4	82-85
Fulton*	0.0*	82-85	21.5*	82-85
Holston	2.6	82-85	25.9	82-85
Rule*	13.7*	82-85	12.4*	82-85
S. Young	6.0	82-85	6.5	82-85
West	8.3	82-85	10.0	82-85
City	5.3	82-85	11.9	82-85

* = "Target Schools"

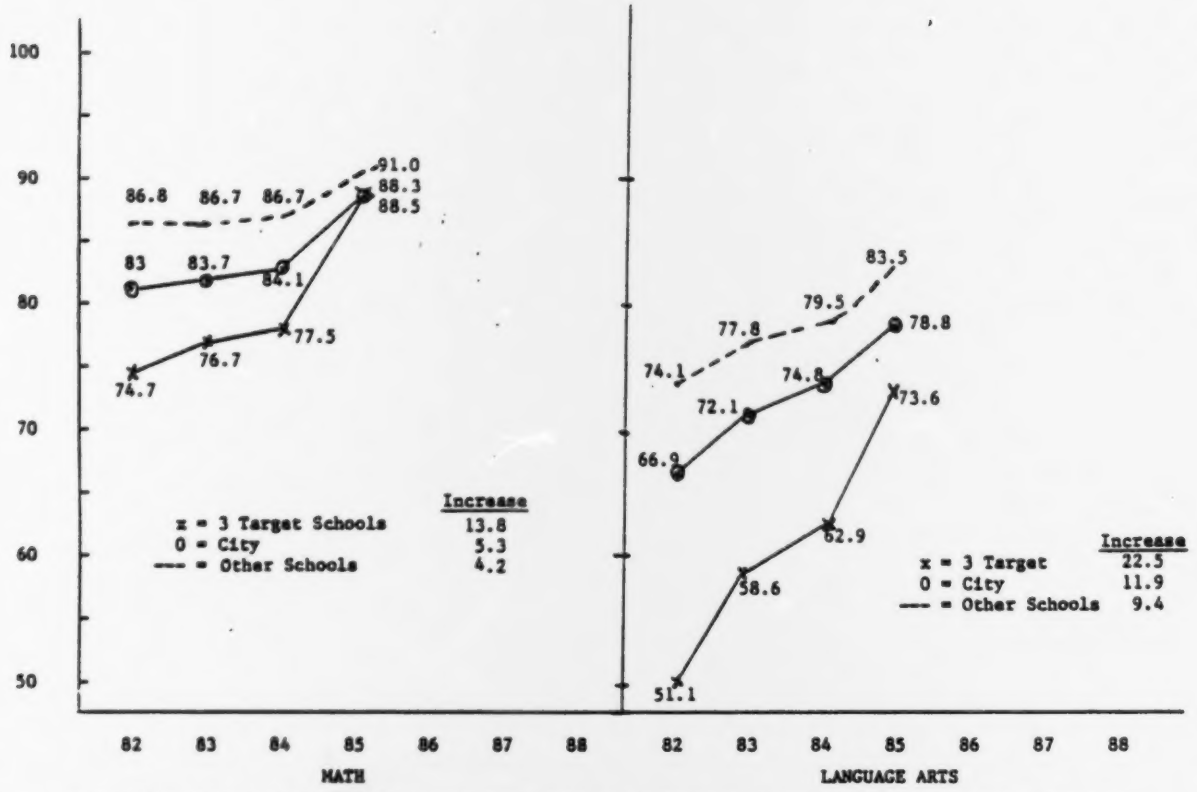

Figure 4 Percent Passing Math and Language Arts in Proficiency Tests in 3 Target Schools, Total City, 5 other schools by year (1982-1985), Knoxville High Schools.

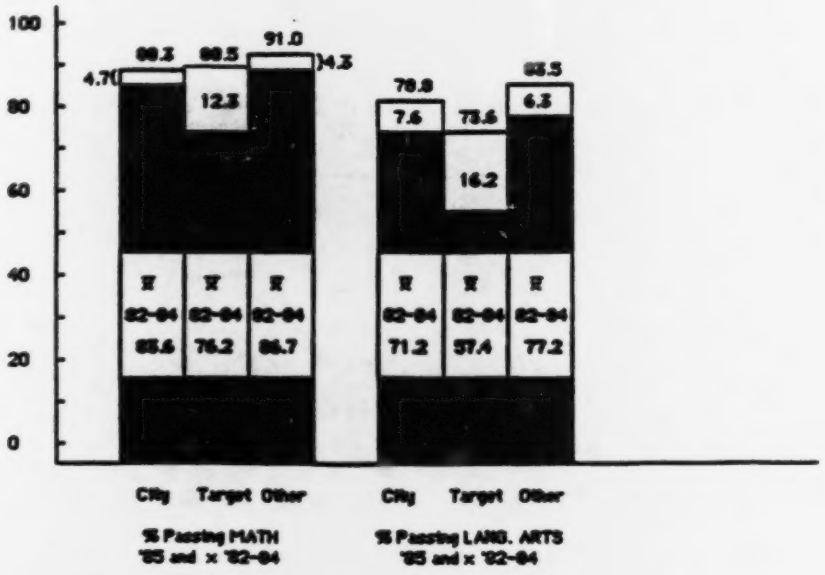

Figure 5 Comparison of Percents Passing Math (M) and Language Arts (LA) Proficiency Tests in 3 Target Schools, 5 other schools and city in 1985 and in the average of 1982-1984: Actual Percents and Percent Difference Between 1985 and Average of 1982-1984: Knoxville City Schools.

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Another way to assess the change in percent passing the proficiency test is to compare the combined averages of the three target schools and of the other five schools. Data in Table 6 show that from 1982-1984 there was considerable consistency in the percent passing M and LA in the target schools and in the other schools. In M (target schools) the 3-year average is 76.2 with a high of 77.5 and a low of 74.7; in other schools the M average is 86.7 with a high of 86.8 and low of 86.7. There is more variation in LA: (target 3-year average of 57.4 with a high of 62.9 and low of 51.1;other 3-year average of 77.2 with a high of 79.5 and low of 74.1). Table 6 data show a continuing tread of generally consistent results with the schools grouped into target and other. The 3-year average provides a baseline against which to measure changes.

Table 7 compares data from 1985 (the first year after treatment) with data from the 3-year baseline. Although there were gains city-wide in the percent passing M and LA, these gains were distributed heavily in favor of target schools. Note that the target school gains in M were 12.3 percent (compared to 2.4 percent for other schools and 4.7 percent for city); target school gains in LA were 16.2 percent (compared to 4.6 percent for other schools and 7.6 percent city-wide). Another way to look at this difference in gains is to compare the percent passing M and LA in target and in other schools (in 1985 and in the baseline of 1982-84) with the percent passing in the city, with the city percent as a divisor. In 1982-84 target schools percents passing M and LA were only 91.1 and 80.6 percent of the city-wide rate. Target schools were 8.9 and 19.4 below the city (100) but other schools were 105.9 and 110.8 or 5.9 and 10.8 above the city. In 1985 there has been a change: The target schools are just above (.2) the city in M and only 6.6 (compared to 19.4) below in LA. The other schools are still slightly above the city (3.1) in M and 5.9 (compared to 10.8)

TABLE 6
Number and Percent of Grade 9 Pupils Taking and Passing Math (M) and Language Arts (LA) Tests 1982-1984 in City, Target Schools (N=3) Other Schools (N=5)

	City			Target			Other		
Math	Pass	Take	%	Pass	Take	%	Pass	Take	%
1984	1505	1789	84.1	392	506	77.5	1113	1283	86.7
1983	1414	1689	83.7	385	502	76.7	1029	1187	86.7
1982	1472	1774	83.0	416	557	74.7	1056	1217	86.8
Total (82-84)	4391	5252	83.6	1193	1565	76.2	3198	3687	86.7
Lang. Arts									
1984	1352	1808	74.8	326	518	62.9	1026	1290	79.5
1983	1218	1690	72.1	295	503	58.6	923	1187	77.8
1982	1190	1780	66.9	287	562	51.1	903	1218	74.1
Total (82-84)	3760	5278	71.2	908	1583	57.4	2852	3695	77.2

TABLE 7
Number and Percent of Grade 9 Pupils Taking and Passing Math (M) and Language Arts (LA) Tests 1985 Compared to Combined 1982-1984 Results in Target (N=3), Other (N=5) and City (N=8) Schools, and Change in Percents (Decrease) or Increase, 1985 vs. Average of 1982-1984

	MATH			LANGUAGE ARTS			PERCENT PASSING AS PERCENT of city	
	Pass	Take	%	Pass	Take	%	M	LA
1982-1984								
Target	1194	1565	76.2	908	1583	57.4	91.1	80.6
Other	3162	3570	88.6	2824	3577	78.9	105.9	110.8
City*	4391	5252	83.6	3760	5278	71.2	100.0	100.0
1985								
Target	433	489	88.5	362	492	73.6	100.2	93.4
Other	1138	1250	91.0	1043	1249	83.5	103.1	105.9
City*	1578	1787	88.3	1411	1791	78.8	100.0	100.0
CHANGE of PERCENTS 1985 and 1982-84								
Target			12.3			16.2	9.1	12.8
Other			2.4			4.6	(2.8)	(4.9)
City			4.7			7.6	0	0

*City Average included more pupils than the sum of these eight schools.

above the city in LA. The target schools, using the city as a constant 100, gained 9.1 in M and 12.9 in LA; the other schools lost (2.8) in M and (4.9) in LA. (Table 7). These shifts support other data pointing to important gains in percent of grade 9 pupils passing M and LA proficiency tests in the target schools. The gains were both absolute and comparative.

In Table 8 the schools are ranked (1-8) on percent passing M and LA tests. (See Table 4, p. 10 for raw data). Schools are ranked for each year: 1982, 1983, and 1984. Sums of ranks for 1982-84 are compiled and schools are ranked for this three-year period. Finally the 1985 ranks are shown, followed by the differences between 1985 ranks and 1982-84 ranks. For each school there are

TABLE 8
Rank (1-8) of Knoxville City High Schools (1982-1985) by Percent of Grade 9 Pupils Passing Math (M) and Language Arts (LA) Proficiency Tests

	1982		1983		1984		82-84**				1985		DIFF (+,-) 82-84 and 85	
	M	LA	M	LA	M	LA	M		LA		M	LA	M	LA
							N	RK	N	RK				
Austin-East*	8	8	8	8	7	7	23	8	23	8	7	6	+1	+2
Bearden	3	1	3	1	2	1	8	3	3	1	2	1	+1	0
Central	2	2	1	2	3	2	6	2	6	2	4.5	4	-2.5	-2
Fulton*	4	6	4	5	4	5	12	4	16	5	3	3	+1	+2
Holston	1	5	2	4	1	3	4	1	12	4	1	2	0	+2
Rule*	7	7	7	7	8	8	22	7	22	7	6	8	+1	-1
South Young	6	4	6	6	6	6	18	6	18	6	8	7	-2	-1
West	5	3	5	3	5	4	15	5	10	3	4.5	5	+ .5	-2

* = Target Schools ** Possible range is from 3 (best) to 24 (worst)

N = Sum of Ranks 1982-1984; RK = Rank of N.

r_s M (82-84 and 85) = .83 r_s LA (82-84 and 85) = .73

two factors (M and LA) that can either gain (+), lose (-), or stay the same (0) in the comparative rankings 1985 and 1982-84. For the 3 target schools there

are 3 x 2 or 6 possibilities; for the other 5 schools there are 5 x 2 or 10 possible changes and for the City there are 8 x 2 or 16 possible changes. Those relationships are in Table 9.

TABLE 9
Number (N) and Percent (%) of Gains and Losses in Rankings of Target and Other Schools in the KCS, 1982-84 and 1985

	Possible		Gain		Loss		Even	
	N	%	N +	%	N -	%	N 0	%
Target (N=3)	6	100	5	83.3	1	16.7	0	0
Other (N=5)	10	100	3	30	5	50	2	20
City (N-8)	16	100	8	50	6	37.5	2	12.5

If the gains and losses (Table 8) are compiled, they are +4.5 and -4.5 for M and +6 and -6 for LA. There were 10.5 possible points for gain and 10.5 points for loss. Those points were distributed as shown in Table 10.

TABLE 10
"Points" and Percents of Gain and Loss in Rankings of Target and Other Schools in the KCS, 1982-84 and 1985.

	Total "Points"					Percent		
	Gain		Loss			Gain	Loss	Tot.
	N	%	N	%	Tot.			
Target Schools (N=3)	7	66.7	1	9.5	8	87.8	12.2	100
Other Schools (N=5)	3.5	33.3	9.5	90.5	13	26.9	73.1	100
Total	10.5	100	10.5	100	21	----	----	---

Thus 7 of 8 total "points" for target schools (87.8%) were gain and 12.2% were loss; 3.5 of 13 total "points" for other schools (26.9%) were gain and 73.1% were loss. For total possible changes (5 of 6 or 83.3% positive) and for percent of total "points" (7 of 10.5 positive, or 66.7%), the target schools out-performed other schools by considerable margins. Put another way, 66.7% of all gain went to 3 target schools and 90.5 of all loss went to other schools (n=5); 87.8% of target school "points" were (+) but only 26.9 of other school "points" were (+). Results suggest that changes are occurring in target schools.

The Control/Experimental Group Comparisons* Using the experimental and control group samples, analyses were made between the pretest and posttest data for M and LA results. The initial statistical procedure was to analyze the pretests (M, LA) and check for homogeneity of variance. The pretest scores of the two groups were not alike (statistically) but their variances were statistically comparable. The experimental group began the project with pretest scores lower than control-group pretest scores.

MATH (Pre)	X	SD	t	P	VAR=
EXPER (170)	48.994	14.84	3.291	.001	F= 1.06; P= .70
CONTROL(175)	54.331	15.28			
LANGUAGE ARTS (Pre)					
EXPER (170)	64.894	18.65	1.818	.069	F= 1.20; P= .237
CONTROL (175)	68.720	20.41			

Similar t-test analyses of posttest scores showed that the groups were the same (statistically) and that there was homogeneity of variance on M but not LA. Inspection of mean scores shows that, although the experimental group began with lower pretest scores than the control group, its posttest scores were slightly higher than those of the control group.

MATH (Post)	X	SD	t	P	VAR=
EXPER (170)	70.011	12.78	-.461	.645	F=1.17; P=.310
CONTROL (175)	69.400	11.83			
LANGUAGE ARTS (Post)					
EXPER (170)	95.464	18.61	-.653	.515	F= 1.50; P= .009
CONTROL (175)	94.006	22.76			

Since the experimental group started below the control group but ended up outscoring the control group slightly, an analysis of covariance design was selected to determine if the pre-post gains of the experimental group were statistically significant. The covariate was the pretest scores. Homogeneity

*SAS procedures for t-tests and for ANCOVA (General Linear Models Procedure) were used.

of the covariate was checked between experimental and control groups (M and LA). If $p<.05$, differences in variances would be considered too great to use the ANCOVA design. Satisfactory homogeneity of variance was obtained (M, $p<.583$; LA, $p<.167$). Using the ANCOVA procedure, statistically significant results ($p<.05$) were found between the experimental and control groups. (Actual probabilities were: M, $p<.0004$; LA, $p<.0007$). The experimental group outperformed the control group on the pre-post gains on the 1984-85 State Proficiency Examination. This was the avowed goal of the project as stated in the project proposal.

ADDITIONAL ANALYSES

An additional question concerning "effective schools" efforts relates to "closing the gap" between various groups on predetermined outcome measures (in this case, M and LA Proficiency Test Scores). For these additional analyses, the two samples (See Table 3, p. 9) were recombined to form a single group (n=345) which was then divided for additional analyses. The group (n=345) was divided by race (white, n=216; non-white, n=129) and by sex (female, n=169; male, n=176). A series of t-tests was used to determine if differences in the average scores of the groups (by race; by sex) were statistically significant at the pretest and again at the posttest for both (M) and (LA). Note (Table 9) that pretest differences are significant* in three of four comparisons (not for M between male and female) but that posttest differences are <u>not</u> significant in three of four comparisons (differences remain between males and females on LA). Differences at pretest seem to follow race and/or sex lines (i.e., the stereo types), but at the posttest there has been some success at "narrowing the gap."

*Significance will be considered $p\leq.05$, but actual levels are shown on the tables as appropriate.

Tests for equal variances are shown at the bottom of Table 11 (p. 20).

As a subsidiary analysis of Proficiency Project data, the evaluators chose to assess the effectiveness of the project in "closing the gap" between low-achieving pupils in the experimental schools and higher-achieving pupils in the control schools. As a first step, the evaluators identified 1) those groups in the control schools that had the highest scores on pretest measures of M and LA and 2) those groups in the experimental schools who had the lowest scores on pretest M and LA. (These, in fact, were the groups that were further apart in all results.) These groups, once identified, became the focus of the evaluation. A t-test was computed to see if differences between the mean scores of the two groups on M and LA proficiency tests was statistically significant. Table 12 provides the groups, their scores, and the results of the t-test for differences in mean scores on pretests of M and LA.

TABLE 12
Pretest Analyses (M, LA) Between Highest/Lowest
Scoring Groups (X, O) in KCS Proficiency Test Project (1984-85)

		MATH(M)			LANGUAGE ARTS (LA)		
Groups	n	$\bar{x}$	SD	t/sig.	$\bar{x}$	SD	t/sig.
Nonwhite (x)	88	46.53	13.27	4.36	61.39	17.58	2.98
White (o)	134	54.99	14.66	.001	69.15	19.88	.003
DIFF.		8.46			7.76		
Male (x)	83	48.72	16.12	3.17	61.47	20.21	3.78
Female (o)	82	56.10	13.64	.002	72.72	18.05	.001
DIFF.		7.38			11.28		

Note that on the pretest (M) the experimental schools non-white respondent group (n=88) scores 46.53 and the white group in the control schools (n=134) scores 54.99. This difference of 8.46 points in mean scores in favor of white students at the control schools was statistically significant.

Table 11
t - Tests by Sex and Race for Total Sample on
Pretest and Posttest Scores
Knoxville City Proficiency Test Project:1984-85

Group	n	$\bar{x}$	SD	t	Prob.	$\bar{x}$	SD	t	Prob.
			Math Pre(1)				Post(2)		
White	216	53.71	15.24	3.21	.002	69.37	12.91	-.656	.512
Non-White	129	48.33	14.80			70.26	11.22		
			Lang. Arts Pre(3)				Post(4)		
White	216	68.96	19.55	2.63	.009	94.67	21.96	.067	.947
Non-White	129	63.27	19.31			94.82	18.79		
			Math Pre(5)				Post(6)		
Male	176	50.86	16.41	-1.04	.298	69.57	13.12	-.205	.837
Female	169	52.57	14.01			69.84	11.40		
			Lang Arts Pre(7)				Post(8)		
Male	176	63.43	21.08	-3.35	.001	91.81	22.55	-2.69	.008
Female	169	70.38	17.35			97.76	18.40		

For Var. are equal: 1) F= 1.06 $p \leq .73$ 2) F= 1.32 $p \leq .08$
Odd Number = pre 3) F= 1.03 $p \leq .88$ 4) F= 1.37 $p \leq .053$
Even Number = post 5) F= 1.37 $p \leq .04$ 6) F= 1.32 $p \leq .07$
7) F= 1.48 $p \leq .01$ 8) F= 1.50 $p \leq .01$

In LA, the non-white pupils in the experimental schools (n=88) achieved a pretest mean score of 61.39 and white pupils in the control schools (n=134) achieved a mean score of 69.15. This difference (7.76) in favor of the white students at the control schools was statistically significant.

There were statistically significant differences between white students in control schools and nonwhite students in the experimental schools on the pretest scores for M and LA. These differences strongly favored white students in the control schools.

Table 12 also shows that female students in control schools (n=82) scored 56.10 on pretest (M), and male students in the experimental schools (n=83) scored 48.72. This difference of 7.38 points favored female students in control schools.

Female students in the control schools (n=82) scores 72.72 on the LA pretest, while male students in the experimental schools (n=83) scored only 61.44. This large difference (11.28) was statistically significant in favor of female pupils in control schools.

At the beginning of the Proficiency Project, females in the control schools were achieving significantly higher test scores than were males in the experimental schools on M and LA pretests. These pretest analyses, in general, show that typical stereotypes were being supported. Non-white students were scoring less well than white students, and female students were outstoring their male counterparts.

At the end of the project's first year, researchers analyzed the posttest scores of these same groups to see if mean score differences were still statistically significant. Table 13 provides those summary results. At the posttest, non-white students in experimental schools (n=88) scored 70.24 on M

and white students in control schools (n=134) scored 69.12. The posttest difference in mean scores, 1.12, favors non-white students in experimental schools. This reversal from pretest results is not statistically significant.

TABLE 13
Posttest Analysis (M, LA) Between Groups (X, O) That Scored Furthest Apart on Pretests in KCS Proficiency Test Project (1984-85)

Groups	n	MATH (M) $\bar{x}$	SD	t/sig.	LANGUAGE ARTS (LA) $\bar{x}$	SD	t/sig.
Nonwhite (x)	88	70.24	11.34	-.69	95.09	17.32	-.43
White (o)	134	69.12	12.07	.49	93.93	23.11	.670
DIFF.		1.12			1.16		
Male (x)	83	69.70	14.57	-.17	92.14	20.46	1.47
Female (o)	82	69.34	11.97	.86	96.83	20.58	.14
DIFF.		.36			4.69		

Non-white students in experimental schools scored 95.09 on the LA posttest and white students in control schools scored 93.93. Difference in mean scores, 1.16, favored non-white students in experimental schools, and was a reversal from pretest results. In both analyses, t-tests indicated that at the posttest between-group differences are not statistically different. The stereotypic race "gap" has been closed.

Female students in control schools scored 69.34 on the math posttest, and their male counterparts in experimental schools scored 69.70. This difference of .36 favored male students in experimental schools and reversed the order of scores obtained on the pretests.

On the posttest (LA) female students in control schools scored 96.83 and male students in experimental schools scored 92.14. In this case, female control-school students maintained their relatively higher scores than their

male counterparts in experimental schools. The difference in the posttest scores between the two groups (4.69) considerably narrowed the gap from the difference in the pretest mean scores (11.28). The t-tests analyses indicate that now--at the posttest--differences between the two groups are not statistically different (.05). Once again, the stereotypic "gap" has been closed--seemingly due to the project's efforts.*

The posttest analyses show that in all four situations there now are no statistically significant differences between the mean scores of the two groups compared. In fact, the only place where differences were not actually reversed is in the comparison between female students in control schools and male students in experimental schools on the LA posttest analysis.

To determine if differences from pre to post were statistically significant, an ANCOVA procedure was employed. Analysis of covariance is a more meaningful procedure if the variances of the covariate (in this case, the pretest results) are statistically the same between the groups being compared. Thus, a test for homogeneity of variance was also conducted. Table 12 presents both the results for the tests of homogeneity of variance and the ANCOVA. Data in Table 14 show that ANCOVA results were statistically significant, even in the situation where the gap between the two groups was not totally closed. Male students in experimental schools--although not totally closing the gap between themselves and females in control schools--performed well enough that their gains (in relation to pretest scores) were statistically more impressive than gains of females in control schools.

*"Seemingly" because the design and analyses are not of a power to let the evaluators speak to cause and effect. These results, however, constitute a replication of findings from numerous other "effective schools"-type projects. As more and more studies achieve similar results, researchers are more and more compelled to note the possibility that project interventions are at least partially responsible for the results.

TABLE 14
Analysis of Covariance (ANCOVA) Pre-to-Post for Gains (M, LA) of Groups Scoring Highest (White, 0; Fem., 0) and Lowest (Male, X; Non-white, X) on Pretests in KCS Proficiency Test Project (1984-85)

	MATH (M)				LANGUAGE ARTS (LA)			
	Hom. of Var.		ANCOVA		Hom. of Var.		ANCOVA	
	F	SIG	F	SIG	F	SIG	F	SIG
N.White/White Pre - Post	1.53 (ok)	.22	14.35	.0001	1.95 (ok)	.19	17.23	.0001
Male/Female Pre - Post	.13 (ok)	.72	11.91	.0001	.25 (ok)	.62	16.41	.0001

Tables in Appendix A show additional analyses. These analyses, although not central to the issue raised here, support the current findings. Table A-1 shows that at the pretests the experimental (x) groups (white/non-white; male/female) always scored lower than the control (o) groups, but that these differences are generally not statistically significant. (Some approach statistical significance with .07, .10, .10, and .09). Only in the pretest (M) for females (x vs. o) are the differences significant (.001). No posttest results are statistically significant, but in all comparisons except one (M, x vs. o) the experimental group scored higher than the control group (generally a reversal from the pretests). These results suggest that whether male or female, white or non-white, test scores at (x) schools were lower than at (o) schools at pretest, but for all groups the gaps between the groups were reduced during the project year.

Table A-2 provides results of pre/post analyses only <u>within</u> the (x) group. On <u>pretests</u> within the (x) group whites and females did better (scored higher) than non-whites and males. (Statistically significant in 3 of 4 comparisons). On the <u>posttests</u> within the (x) group the gap has narrowed considerably, and

only one of four comparisons is statistically significant. In three of four comparisons the average scores for the two groups are nearly identical. During the project year, the gaps between the groups (race/sex) in the (x) schools were reduced or eliminated.

Table A-3 shows results of pre/post analyses only within the control schools. In all cases in the pretests (race/sex comparisons) except for the LA (male vs. female) there are no statistically significant differences (the groups' scores are generally similar). The slight actual differences favor whites and females over non-whites and males. At the posttest there are no statistically significant differences on any of the comparisons. The groups' scores still are very similar. Slight actual differences are found and they favor non-white over white (M, LA) and the differences in LA (race) still favor the female group. In the comparisons (pre/post) in the control school there have not been any major (statistically significant) shifts.

Inferences from these three tables (A-1, A-2, A-3) suggest that something "happened" in the (x) schools and changes occurred. Little "happened" in the (o) schools and no changes were noted. Whatever it was that "happened" could have been serendipitous; it probably was at least partially the result of the Proficiency Project efforts.

SUMMARY AND CONCLUSIONS

Based upon several analyses of varying degrees of sophistication, the "Knoxville City School Project to Improve Proficiency Scores in Selected Ninth Grades" seems to have been successful in 1984-85. The evaluation lacks precise enough design and controls to state cause and effect relationships. Results, however, seem clear: a project, following some tenets of effective schooling work, was implemented in schools that traditionally had not done well on the

state proficiency tests. A review of records and events, interviews, and observations indicated that the "treatment" was implemented.

Major gains on the single criterion measure--percent of pupils passing the proficiency test--were observed in 1985. An analysis of covariance supported the assertion that the sample of project youngsters significantly outperformed a similar sample of "control" pupils.

Since the State Proficiency Test is criterion-referenced, it is possible for all city schools to increase their percents of pupils passing. Thus, even if the target schools should slip in the rankings (among the eight schools in KCS), they can continue to improve relative to the criterion of 100 percent passing the Proficiency Test. Noting the rather substantial gains in 1985, it may be unrealistic to anticipate equally large gains in future project years. A realistic goal would now be to hold the new gains and then to make small gains each successive year.

Project results have caused some increase in spirit, morale, and satisfaction among participants. The community involvement and the reward structures have given the schools and community some common grounds for cooperation. These "affective" gains are positive in building an improved "image" of the schools.

These analyses (singly and in combination) strongly suggest that the Proficiency Project was successful in its major purpose of improving the proficiency test scores of ninth-grade youngsters in schools where test results traditionally have been poor. Whatever strategies and techniques were being used in those schools to achieve this result seemed to work during the project's first year. We shall be interested to see if these gains can be maintained, and if the traditional gaps between minority and white students, between male and

female students, and between students in schools serving higher and lower socio-economic status (SES) neighborhoods can be maintained. In the project's second year (1985-86), many ninth-grade youngsters in target schools (Austin-East, Fulton, Rule) will be from eighth-grades in middle schools (Beardsley, Christenberry, Vine) served by the project in 1984-85. We have to determine if pupils in the project two years are more successful than those in the project for only one year. A longitudinal study would analyze graduation rates of A-E, Fulton, Rule for 1986, 1987, 1988, and 1989. Students in 1988 and 1989 will have had the benefit of the proficiency project; those from 1986 and 1987 will not. Will the initial gains last?

As with many "Effective Schools" projects this evaluation was not able to identify which treatments had the greatest impact. The project-as-a-whole seemed to contribute to considerable increases in the percent of grade-nine pupils passing the proficiency test in three "target" schools: Austin-East, Fulton, and Rule. This was the project's goal.

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Note

Portions of this paper, especially tables and figures, have been taken from the first-year evaluation report of the project.

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APPENDIX A

TABLES A-1, A-2, A-3

SHOWING SUBSIDIARY ANALYSES

Table A-1

t - Tests by Race and Sex for Experimental Vs. Control Groups on Pretest and Posttest Scores, KCS, 1984-85

					Math					
				Pre(1,3)					Post(2,4)	
Group		n	x	SD	t	Prob.	x	SD	t	Prob.
Non-white	O	41	52.20	17.19	1.865	.07	70.32	11.10	.037	.97
	X	88	46.53	13.27			70.24	11.34		
White	O	134	54.99	14.66	1.574	.117	69.12	12.07	-.358	.72
	X	82	51.63	16.02			69.77	14.23		
					Lang. Arts					
				Pre(5,7)					Post(6,8)	
Non-white	O	41	67.32	22.27	1.635	.10	94.24	21.84	-.238	.81
	X	88	61.39	17.58			95.09	17.32		
White	O	134	69.15	19.88	.179	.858	93.92	23.11	-.627	.53
	X	82	68.66	19.12			95.87	20.01		
					Math					
				Pre(9,11)					Post(10,12)	
Male	O	93	52.77	16.51	1.643	.10	69.45	11.77	-.123	.90
	X	83	48.72	16.12			69.70	14.57		
Female	O	82	56.10	13.64	3.265	.001	69.34	11.97	-.55	.58
	X	87	49.25	13.60			70.31	10.89		
					Lang. Arts					
				Pre(13,15)					Post(14,16)	
Male	O	93	65.19	21.78	1.179	.24	91.52	24.36	-.184	.85
	X	83	61.45	20.21			92.14	20.46		
Female	O	82	70.72	18.05	1.708	.09	96.83	20.58	-.631	.53
	X	87	68.18	16.47			98.63	16.15		

For Var. are equal:
Odd numbers = pre
Even numbers = post

1) $F = 1.68$ $p < .05$
2) $F = 1.05$ $p < .90$
3) $F = 1.19$ $p < .36$
4) $F = 1.39$ $p < .09$
5) $F = 1.60$ $p < .07$
6) $F = 1.59$ $p < .07$
7) $F = 1.08$ $p < .71$
8) $F = 1.33$ $p < .16$
9) $F = 1.05$ $p < .82$
10) $F = 1.53$ $p < .05$
11) $F = 1.01$ $p < .97$
12) $F = 1.21$ $p < .39$
13) $F = 1.16$ $p < .49$
14) $F = 1.42$ $p < .10$
15) $F = 1.20$ $p < .40$
16) $F = 1.62$ $p < .03$

Table A-2

t-Tests by Race and Sex for Experimental Group (n=170) on Pretest and Posttest Scores, KCS, 1984-85

					Math				
			Pre(1)					Post(2)	
Group	n	x	SD	t	Prob.	x	SD	t	Prob.
White	82	51.63	16.02	2.562	.02	69.77	14.23	-.237	.81
Non-white	88	46.53	13.27			70.24	11.34		
					Lang. Arts				
			Pre(3)					Post(4)	
White	82	68.66	19.12	2.583	.01	95.87	20.01	-.271	.79
Non-white	88	61.39	17.58			95.09	17.32		
					Math				
			Pre(5)					Post(6)	
Male	83	48.72	16.12	-.232	.82	69.70	14.57	-.310	.76
Female	87	49.25	13.60			70.31	10.89		
					Lang. Arts				
			Pre(7)					Post(8)	
Male	83	61.45	20.21	-2.388	.02	92.14	20.46	-2.288	.02
Female	87	68.18	16.47			98.63	16.15		

For H_o Var. are equal: 1) $F = 1.46$ $p \leq .09$ 2) $F = 1.57$ $p \leq .04$
Odd numbers = pre 3) $F = 1.18$ $p \leq .44$ 4) $F = 1.33$ $p \leq .19$
Even numbers = post 5) $F = 1.40$ $p \leq .12$ 6) $F = 1.79$ $p \leq .01$
7) $F = 1.51$ $p \leq .06$ 8) $F = 1.60$ $P \leq .03$

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Table A-3

t-Tests by Race and Sex for Control Group (n=175) on Pretest and Posttest Scores, KCS, 1984-85

				Math					
			Pre(1)				Post(2)		
Group	n	x	SD	t	Prob.	x	SD	t	Prob.
White	134	54.99	14.66	1.023	.31	69.12	12.07	-.566	.572
Non-white	41	52.20	17.19			70.32	11.10		
				Lang. Arts					
			Pre(3)				Post(4)		
White	134	69.15	19.88	.502	.62	93.93	23.11	-.076	.94
Non-white	41	67.32	22.27			94.24	21.84		
				Math					
			Pre(5)				Post(6)		
Male	93	52.77	16.51	-1.440	.15	69.45	11.77	.061	.95
Female	82	56.10	13.64			69.34	11.97		
				Lang. Arts.					
			Pre(7)				Post(8)		
Male	93	65.19	21.73	-2.469	.01	91.52	24.36	-1.547	.12
Female	82	72.72	18.05			96.83	20.58		

For H_o Var. are equal:
Odd numbers = pre
Even numbers = post

1) $F = 1.38$ $p \leq .18$
2) $F = 1.18$ $p \leq .55$
3) $F = 1.26$ $p \leq .34$
4) $F = 1.12$ $p \leq .69$
5) $F = 1.46$ $p \leq .08$
6) $F = 1.03$ $p \leq .87$
7) $F = 1.46$ $p \leq .08$
8) $F = 1.40$ $p \leq .12$

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